Appendix F

Westbay Instruments, Inc. (Schlumberger) Completion Report

May 31, 2006
WB843

By Courier

Erich Neher
CH2M-WG Idaho
2525 Fremont Avenue, P.O. Box 1625
Idaho Falls, Idaho
83415
U.S.A.

Subject: Completion Report for Westbay MP55 Multilevel Monitoring Wells: Middle-2050A, Middle-2051, Idaho Falls, Idaho.

Dear Mr. Neher,

This report summarizes the work carried out by Westbay Instruments Inc. related to the installation of two MP55 monitoring wells in Idaho Falls, Idaho. This work was completed under CH2M-WG Idaho (CWI) Contract Number 00501347 dated July 18, 2005. Westbay representative Mr. Mark Lessard was on-site from August 29 to September 27, 2005 for installation of the two Westbay wells. The MP55 multilevel monitoring wells were successfully installed passing all of Westbay's standard quality assurance tests.

We look forward to working with you in the future. Please call if you have any questions or comments.

Yours truly,

Mark Lessard

Encl.: Bound Completion Report for Westbay MP55 wells Middle-2050A, Middle-2051.

COMPLETION REPORT

MP38 Monitoring Wells:

Middle-2050A, Middle-2051

Prepared for:

CH2M-WG Idaho

2525 Fremont Avenue, P.O. Box 1625

Idaho Falls, Idaho

83415

U.S.A.

Prepared by:

Westbay Instruments Inc.

WB843

May 31, 2006

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APPENDIX 2: Middle-2051

1. Introduction

This report and the attached Appendices document the technical services carried out by Westbay Instruments Inc. under CH2M-WG Idaho (CWI) Contract Number 00501347 dated July 18, 2005. A Westbay MP 55 groundwater monitoring system was installed in boreholes Middle-2050A and Middle-2051, in Idaho Falls, Idaho.

Westbay technical services representative Mr. Mark Lessard was on site for the installations from August 29 to September 27, 2005. Lori Lopez of CWI provided supervision of the work. This report documents the installation tasks and related QA checks.

2. Installation

The monitoring wells were installed on the dates indicated below.

(Note: all depths are with respect to the zero reference point on the twelve-inch surface casing. Monitoring well reference elevations were not available at the time of writing).

Monitoring Well No.	Installation Dates	Borehole Depth (ft)	MP55 Casing Length (ft)	Surface Casing (ft)	No. Monitoring Zones
Middle-2050A	Aug 30 – Sep 12	1376	1376	420	5
Middle-2051	Sep 13 - 23	1178	1177	427	5

The wells were installed according to the procedure described below.

2.1 Previous Activities

Two boreholes each with diameter a of 5 7/8-inches were drilled by core drilling with foam and water prior to Westbay's arrival on site. Mild steel 12-in. surface casing was installed by hammer in each borehole. A steel casing (#134 rods) with a nominal ID of 4 1/16-inches and a casing shoe on the bottom was lowered near the bottom of each borehole to act as a guide tube for the MP System casing.

2.2 Preparation of Monitoring Well Design

Mr. Erik Whitmore provided preliminary monitoring zone locations for the wells to Westbay Instruments Inc. This information was used to construct preliminary Casing Installation Logs, which specify the location of components in the boreholes. The logs were reviewed and approved in the field by Mr. Syl Losinski and Mr. Erick Neher prior to installation of the wells. The Casing Installation Logs as approved were used as an installation guide in the field. Field copies of the logs are in the Appendices.

An MP measurement port coupling was included in each monitoring zone to provide the capability to measure fluid pressures and collect fluid samples. Measurement port couplings were also included in QA zones to provide QA testing capabilities and to permit operation of the squeeze relief venting capabilities of the MP55 packer inflation tool. A pumping port coupling was also included in each monitoring zone to provide purging and hydraulic conductivity testing capabilities.

2.3 Layout of MP Casing Components

Prior to installation, the MP System casing components were set out at the boreholes according to the sequence indicated on the appropriate Casing Installation Log. Each casing length was numbered beginning with the lowermost as an aid to confirming the proper sequence of components. The appropriate MP System couplings were attached to the casing sections. Magnetic location collars were attached 2-ft. below the center of the MP measurement port in each sampling zone. The location of each magnetic collar is 3-ft. above the respective pumping port where present. Each casing component was strapped and the actual lengths were entered in Westbay's Well Designer software program. These lengths were used on the final design of the wells.

Each casing component was visually inspected. Serial numbers for each MP packer, MP pumping port and MP measurement port coupling were recorded on the Casing Installation Log.

2.4 Lowering of MP Components

The MP casing components were lowered into the steel guide tube with assistance of a drilling rig. Each casing joint was tested with a minimum internal hydraulic pressure of 250 psi for one minute to confirm hydraulic seals. A record of each successful joint test and the placement of each casing component are noted on the Casing Installation Log by check marks.

Clean water supplied by Major Drilling Inc. was added to the MP casing when necessary to counter buoyancy effects while components were lowered, and for testing of joint seals during lowering.

2.5 Hydraulic Integrity Testing

After the MP casings were lowered into the guide tube, the water level inside the MP casing was monitored at a depth different from the open borehole water level for a minimum period of thirty minutes to confirm hydraulic integrity of the casing. The data from the hydraulic integrity tests are shown on the last page of the respective MP Casing Logs in the Appendices. The borehole water level and MP55 casing pre-inflation water level are noted on the following table:

Table 1, Summary of Water Levels for Hydraulic Integrity Tests.

Borehole No.	Middle-2505A	Middle-2051
Borehole water level (Top of 12-inch surface casing)	480 ft.	575 ft.
MP Casing water level (Top of MP casing)	854.60 ft.	531.99 ft.

In each case the test indicated that the MP casing was water tight prior to packer inflation.

2.6 Positioning of MP Components

After the components were lowered into the borehole, the MP casing string was positioned as indicated on the cover page of the Summary Casing Log. Top of twelve-inch surface casing was used as the borehole datum. The MP casing string was supported in this position while packer inflation was carried out. Summary Casing Logs, which show the final "as-built" locations of the components in each well, are included in the Appendices. The depths of key items in each well are shown on Table 2.

2.7 Pre-inflation Profile

A pre-inflation pressure profile was carried out at each well to confirm the proper operation and position of measurement ports and magnetic collars prior to inflating the packers. The data confirmed that the ports operated properly and are positioned correctly as shown on Figure 1 in the Appendices. The data for the pre-inflation profiles are also included in the Appendices.

2.8 Inflation of MP System Packers

The MP packers were inflated sequentially beginning at the bottom of each well using clean water. Westbay's model No. 6055 vented inflation tool was used for packer inflation. The guide tube was retrieved from the borehole in stages to protect the MP casing from borehole caving. In well No. Middle-2051, it was noted that the packer inflation pressure was lower than expected with packers No. 10, 14 and 16. On inspection of the inflation data and review of inflation tool performance, it was concluded that the lower pressure was due to a tool malfunction. All of the packers appear to have inflated normally. The data for inflation of each packer are provided on the MP Packer Inflation Records included in the Appendices.

3. Fluid Pressure Measurements

After packer inflation was completed, fluid pressures were measured at each measurement port. At that time, the in-situ formation pressures may not have recovered from the pre-installation activities and potential groundwater pressure increases in monitoring zones that may result from packer inflation. This latter effect may be more likely to occur in monitoring zones located in low-permeability geological formations. Longer term monitoring may be required to establish representative fluid pressures.

A plot of the Piezometric Levels in all zones in each well is shown on Figure 2 and in the monitoring zones only on Figure 3 in the respective Appendices. The data were examined to confirm proper operation of the measurement ports and as a check on the presence of annulus seals between monitoring zones. The calculation sheets for the pressure profiles are also enclosed in the Appendices.

4. Operator Training

Training was provided to CWI representatives Dave Hawley, Danielle Millward, Amy Millward and Tiffany Park.
The training covered the following areas:

- Operation and maintenance of Model 2531 Sampler Probe and Mosdax Magi controller in pressure profiling, sample collection and operation of MP55 hydraulic pumping ports.
- Cable reheading and troubleshooting.

Table 2a, Depths of Key Items for MP Monitoring Well Middle-2050A.

Zone No.	Monitoring Interval* (ft)	MP Casing No. (from MP Log) (ft)	Packer No.	Packer Serial No.	Nominal Packer Position *** (ft)	Magnetic Collar Depth (ft)	Measurement Port Depths** (ft)	Pumping Port Depth** (ft)	Port Name
QA1	----	12	1	059	1262.0	----	1266.5	----	QA1
QA2	----	17	2	077	1224.3	----	1228.7	----	QA2
1	1178.8-1224.3	----	----	----	----	1180.8	1178.8	1189.1	Zone 1
----	----	23	3	076	1174.3	----	----	----	----
QA3	----	34	4	064	1075.9	----	1080.3	----	QA3
QA4	----	39	5	066	1038.1	----	1042.6	----	QA4
2	997.6-1038.1	----	----	----	----	999.6	997.6	1007.9	Zone 2
----	----	44	6	082	993.1	----	----	----	----
QA5	----	61	7	073	837.3	----	841.7	----	QA5
QA6	----	66	8	060	804.5	----	809.0	----	QA6
3	786.9-804.5	----	----	----	----	792.2	790.2	800.5	Zone 3
----	----	70	9	061	782.4	----	----	----	----
QA7	----	78	10	078	713.6	----	718.0	----	QA7
QA8	----	81	11	063	700.4	----	704.9	----	QA8
4	641.9-700.4	----	----	----	----	643.9	641.9	652.1	Zone 4
----	----	89	12	075	637.4	----	----	----	----
QA9	----	92	13	071	617.7	----	622.2	----	QA9
QA10	----	102	14	072	535.7	----	540.2	----	QA10
5	463.6-535.7	----	----	----	----	516.9	463.6 / 514.9	525.2	Zone 5
----	----	112	15	074	459.1	----	----	----	----
QA11	----	134	16	062	247.6	----	252.1	----	QA11

* Note: depths are with respect to top of the twelve-inch surface casing.

** Component positions are referenced to the top of the subject MP System coupling.

*** Packer positions are referenced to the top of the top MP System coupling on the packer.

Table 2b, Depths of Key Items for MP Monitoring Well Middle-2051.

Zone No.	Monitoring Interval* (ft)	MP Casing No. (from MP Log) (ft)	Packer No.	Packer Serial No.	Nominal Packer Position *** (ft)	Magnetic Collar Depth (ft)	Measurement Port Depths** (ft)	Pumping Port Depth** (ft)	Port Name
1	1142.5-1178.1	----	----	----	----	1144.5	1142.5	1152.8	Zone 1
----	----	5	1	068	1138.0	----	----	----	----
QA1	----	7	2	070	1128.2	----	1132.6	----	QA1
2	1092.5-1128.2	----	----	----	----	1094.5	1092.5	1102.8	Zone 2
----	----	12	3	079	1088.1	----	----	----	----
QA2	----	22	4	058	999.5	----	1004.0	----	QA2
QA3	----	35	5	069	876.5	----	881.0	----	QA3
3	827.8-876.5	----	----	----	----	829.8	827.8	838.1	Zone 3
----	----	42	6	081	823.4	----	----	----	----
QA4	----	46	7	080	788.9	----	793.4	----	QA4
QA5	----	49	8	057	770.9	----	775.4	----	QA5
4	745.2-770.9	----	----	----	----	752.1	750.1	760.4	Zone 4
----	----	54	9	067	740.7	----	----	----	----
QA6	----	65	10	065	644.0	----	648.5	----	QA6
QA7	----	69	11	056	609.6	----	614.1	----	QA7
5	563.7-609.6	----	----	----	----	606.2	563.7 / 604.2	593.7	Zone 5
----	----	75	12	054	559.2	----	----	----	----
QA8	----	103	13	055	289.2	----	293.7	----	QA8

* Note: depths are with respect to top of the twelve-inch surface casing.

** Component positions are referenced to the top of the subject MP System coupling.

*** Packer positions are referenced to the top of the top MP System coupling on the packer.

APPENDIX 1

Monitoring Well Middle-2050A

Summary Casing Log	- 7 pages
Figure 1, Pre-Inflation Pressure Profile	- 1 page
Pre-inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheet (Sept 19, 2005)	- 1 page
Figure 2, Piezometric Pressure Profile	- 2 pages
Piezometric Pressure/Levels	
Field Data and Calculation Sheet (Sept 23, 2005)	- 1 page
Casing Installation Log (field copy)	- 16 pages
MP Packer Inflation Records	- 24 pages

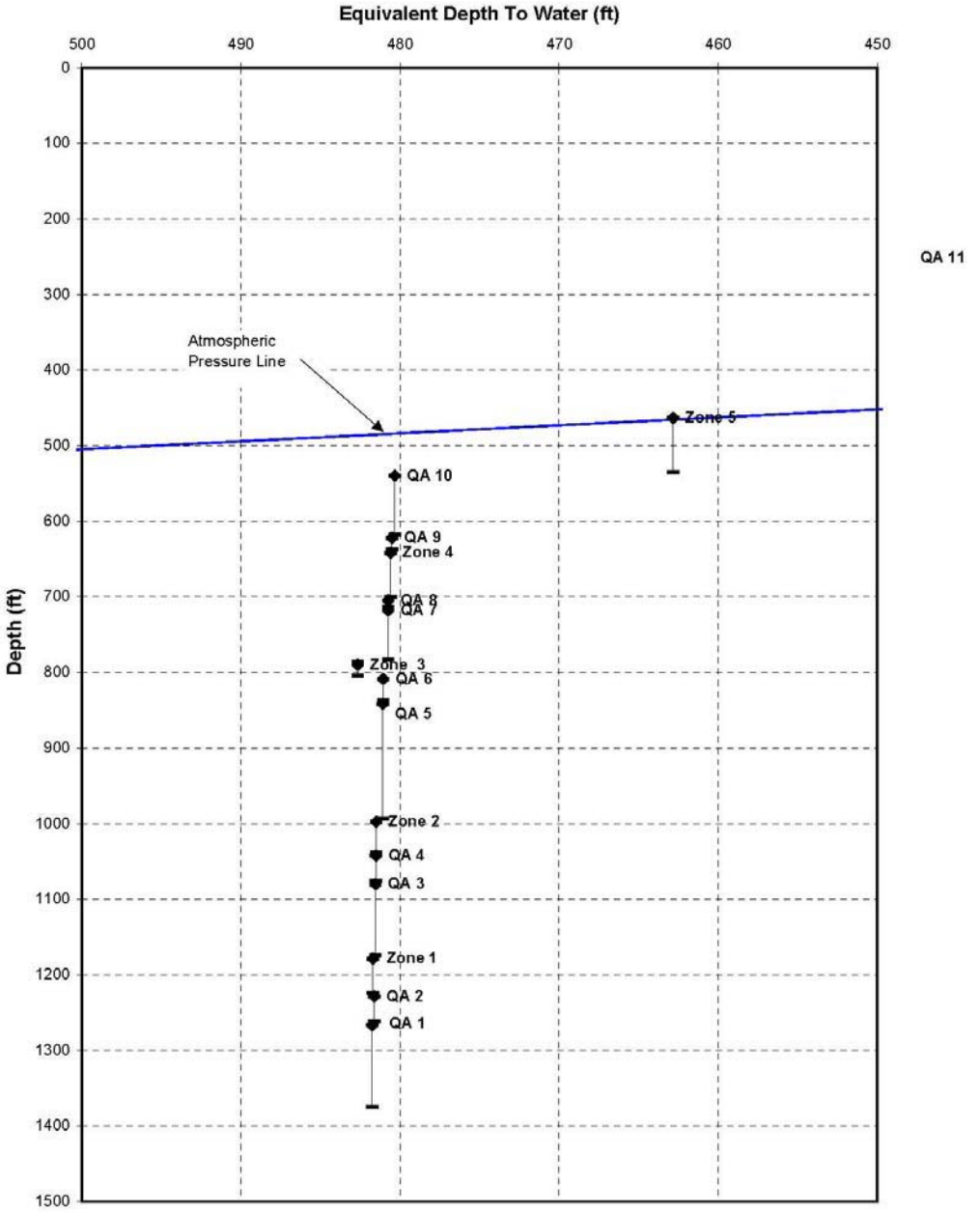
APPENDIX 2

Monitoring Well Middle-2051

Summary Casing Log	- 6 pages
Figure 1, Pre-Inflation Pressure Profile	- 1 page
Pre-inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheet (Sept 2, 2005)	- 1 page
Figure 2, Piezometric Pressure Profile	- 2 pages
Piezometric Pressure/Levels	
Field Data and Calculation Sheet (Sept 12, 2005)	- 1 page
Casing Installation Log (field copy)	- 14 pages
MP Packer Inflation Records	- 20 pages

Piezometric Profile
Monitoring Well: Middle-2050A

Profile Date: September 19/2005
Comments: Pre-Inflation



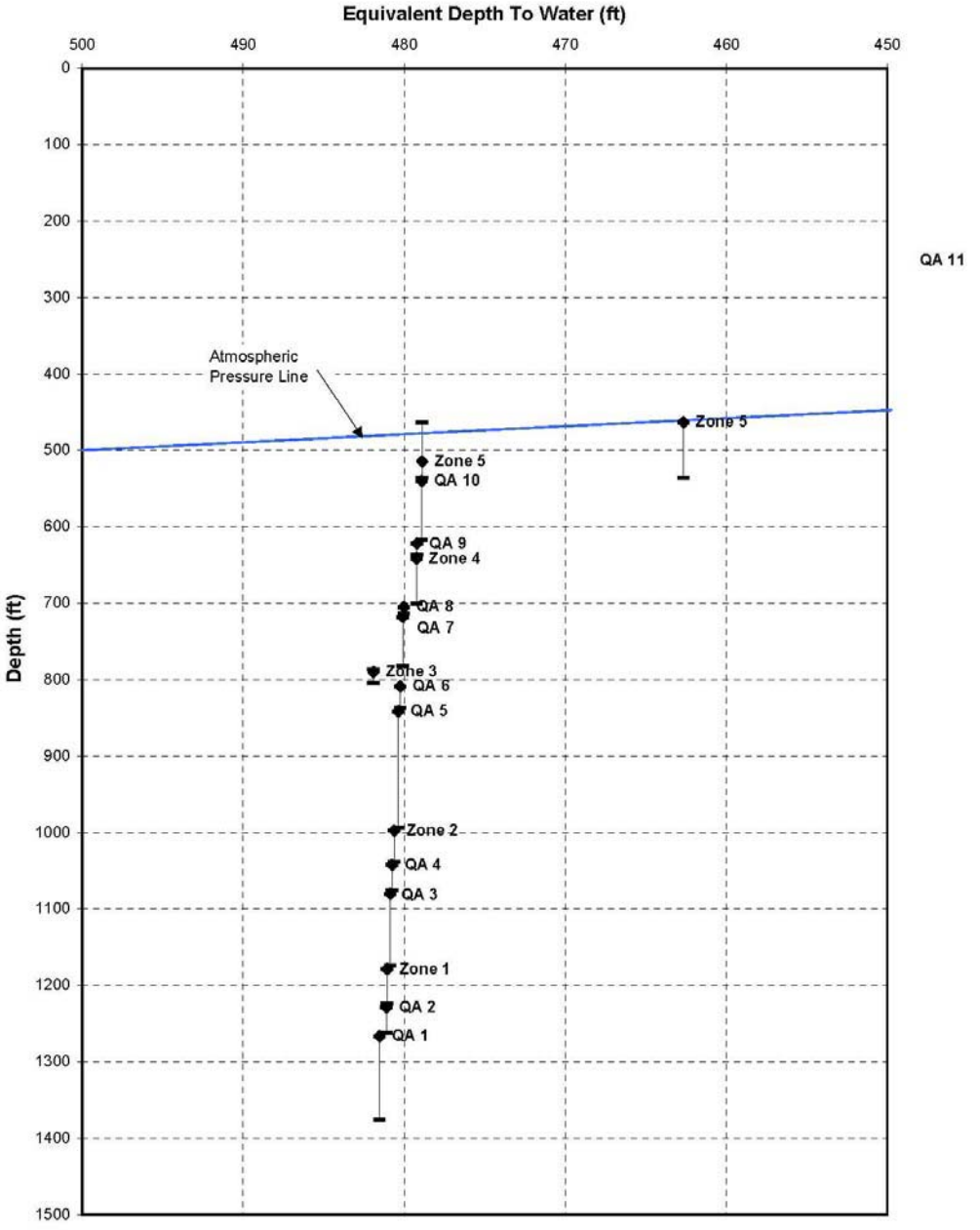
Client: CWI-INL
Site: Idaho Falls, ID
Datum: Top of 12 inch surface casing

Figure 1

Plot By:____ Date:____
Checked By:____Date:____
Westbay Project:WB 843
2050A.xls

Piezometric Profile
Monitoring Well: Middle-2050A

Profile Date: September 23/2005
Comments: Post-Inflation Profile



Plot By:_____ Date:____
Checked By:____ Date:____

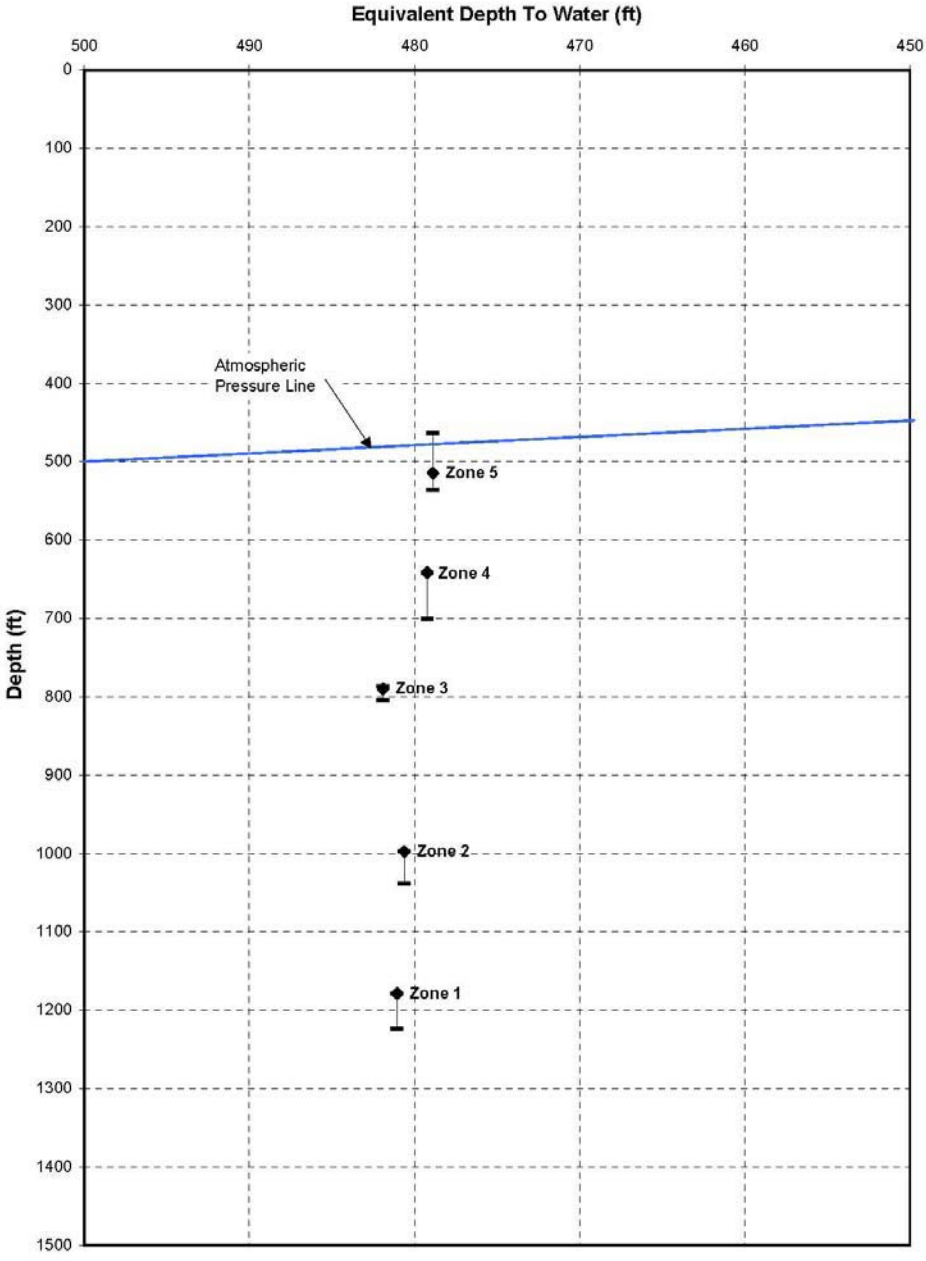
Client: CWI-INL
Site: Idaho Falls, ID
Datum: Top of 12 inch surface casing

Westbay Project: 843
2050A.xls

Figure 2

Piezometric Profile
Monitoring Well: Middle-2050A

Profile Date: September 23/2005
Comments: Monitoring zones only



Plot By:_____ Date:____
Checked By:____ Date:____

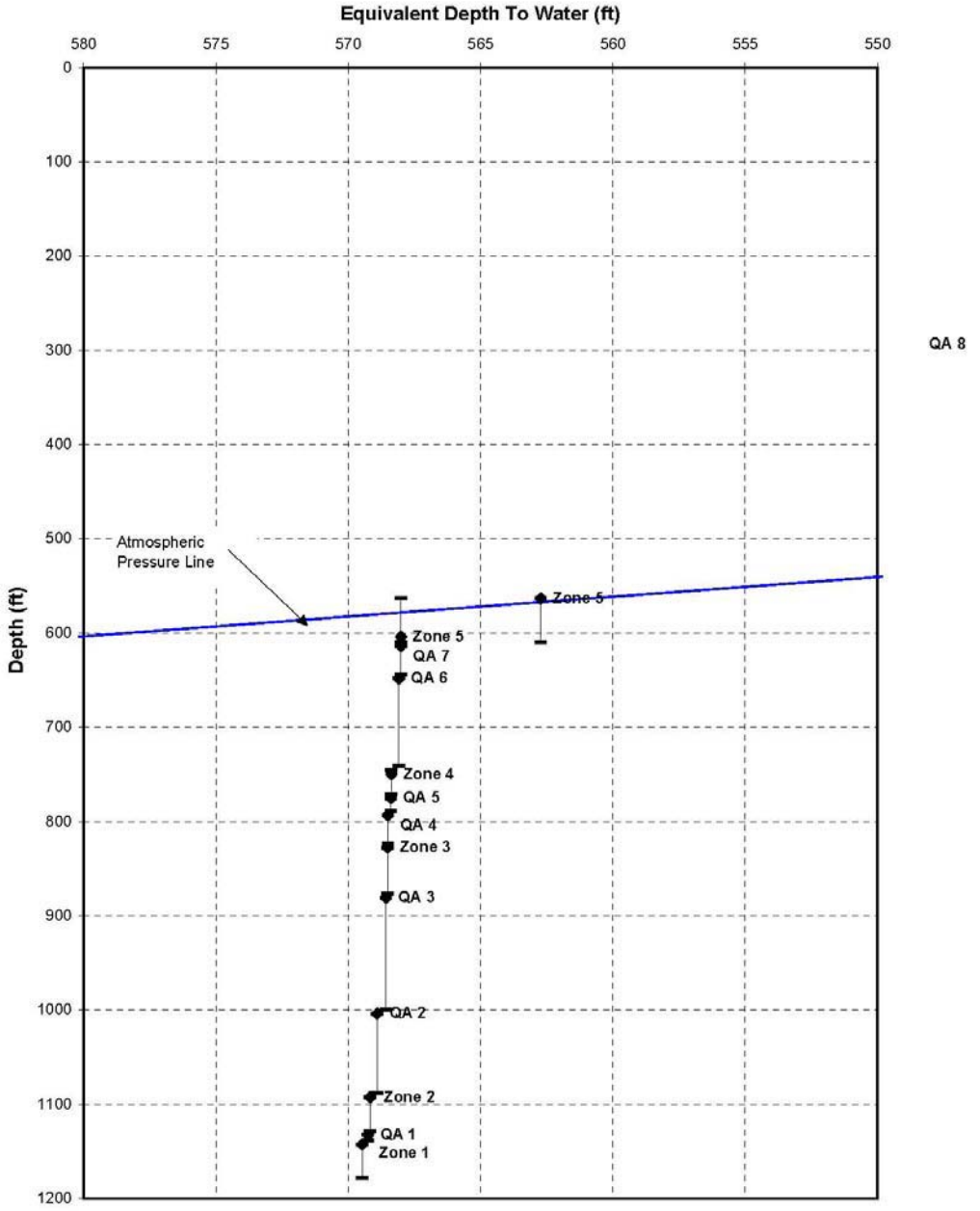
Client: CWI-INL
Site: Idaho Falls, ID
Datum: Top of 12 inch surface casing

Figure 3

Westbay Project: 843
2050Azonly.xls

Piezometric Profile
Monitoring Well: Middle-2051

Profile Date: September 2/2005
Comments: Pre-Inflation



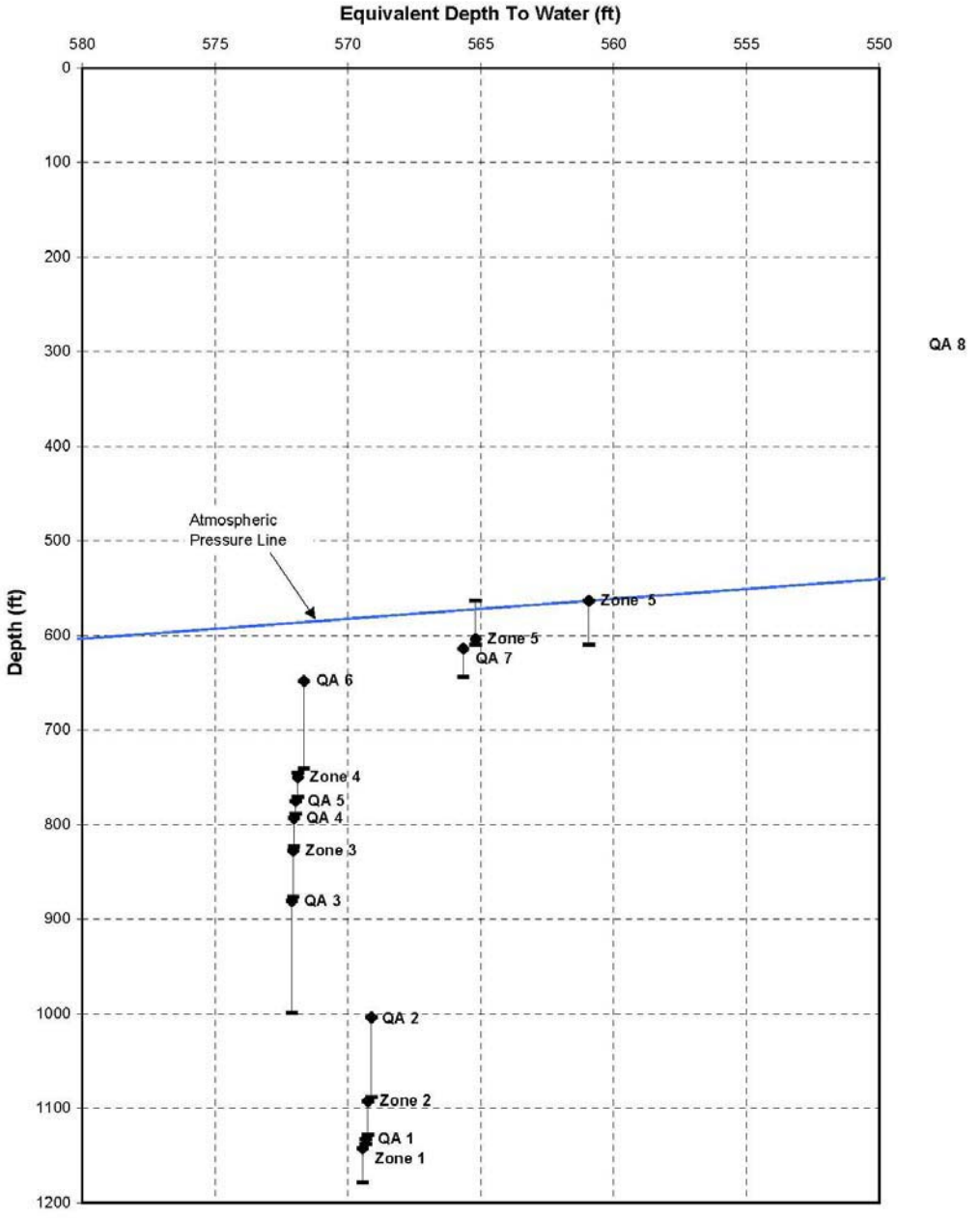
Client: CWI-INL
Site: Idaho Falls, ID
Datum: Top of 12 inch surface casing

Figure 1

Plot By:____ Date:____
Checked By:____Date:____
Westbay Project: WB 843
2051.xls

Piezometric Profile
Monitoring Well: Middle-2051

Profile Date: September 12/2005
Comments: Post-Inflation Profile



Plot By:_____ Date:____
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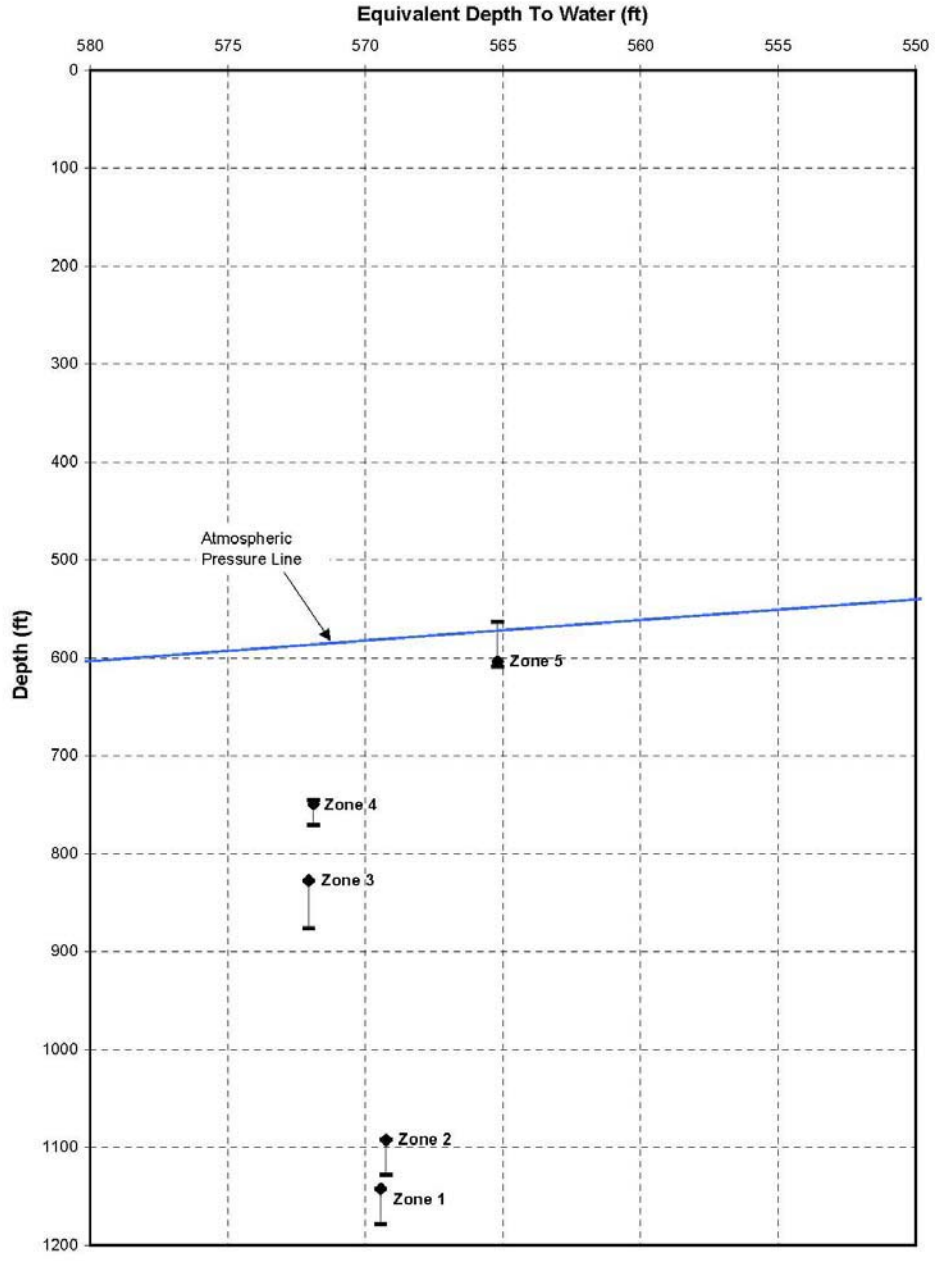
Client: CWI-INL
Site: Idaho Falls, ID
Datum: Top of 12 inch surface casing

Westbay Project: 843
2051.xls

Figure 2

Piezometric Profile
Monitoring Well: Middle-2051

Profile Date: September 12/2005
Comments: Monitoring Zones Only



Plot By:_____ Date:____
Checked By:____ Date:____

Client: CWI-INL
Site: Idaho Falls, ID
Datum: Top of 12 inch surface casing

Figure 3

Westbay Project: 843
2051zonly.xls

Summary Casing Log

Company: CWI-INL
Well: Middle-2050A
Site: Idaho National Lab
Project: Groundwater investigation

Job No: WB 843
Author: DL/ML

Well Information

Reference Datum: Ground Level
Elevation of Datum: 0.00 ft.
MP Casing Top: 0.00 ft.
MP Casing Length: 1375.97 ft.

Borehole Depth: 1376.00 ft.
Borehole Inclination: Vertical
Borehole Diameter: 0.00 in.

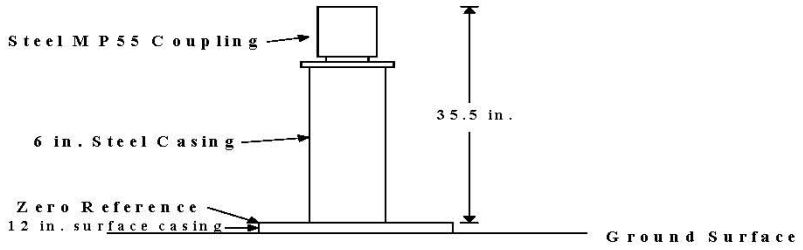
Well Description:
INL
Other References:
Revised September 15, 2005

File Information

File Name: 2050A_FN.WWD
Report Date: Wed Nov 02 10:23:29 2005

File Date: Sep 19 09:26:06 2005

Sketch of Wellhead Completion



Summary Casing Log
CWI-INL

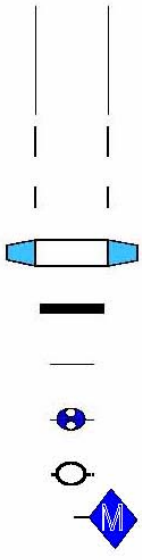
Job No: WB 843
Well: Middle-2050A

Legend

(Qty) MP Components
(Library - WD Library 7/27/00)

Geology

Backfill/Casing



(123) 060130 - MP55 Casing 1 (3M/10F)

Rock

(10) 060115 - MP55 Casing 2 (1.5M/5F)

(12) 060110 - MP55 Casing 3 (1M/3F)

(16) 0604 - MP55 Packer 100mm PVC(1.5M/5F)

(1) 0603 - MP55 End Plug

(140) 0602 - MP55 Regular Coupling

(17) 0605 - MP55 Measurement Port

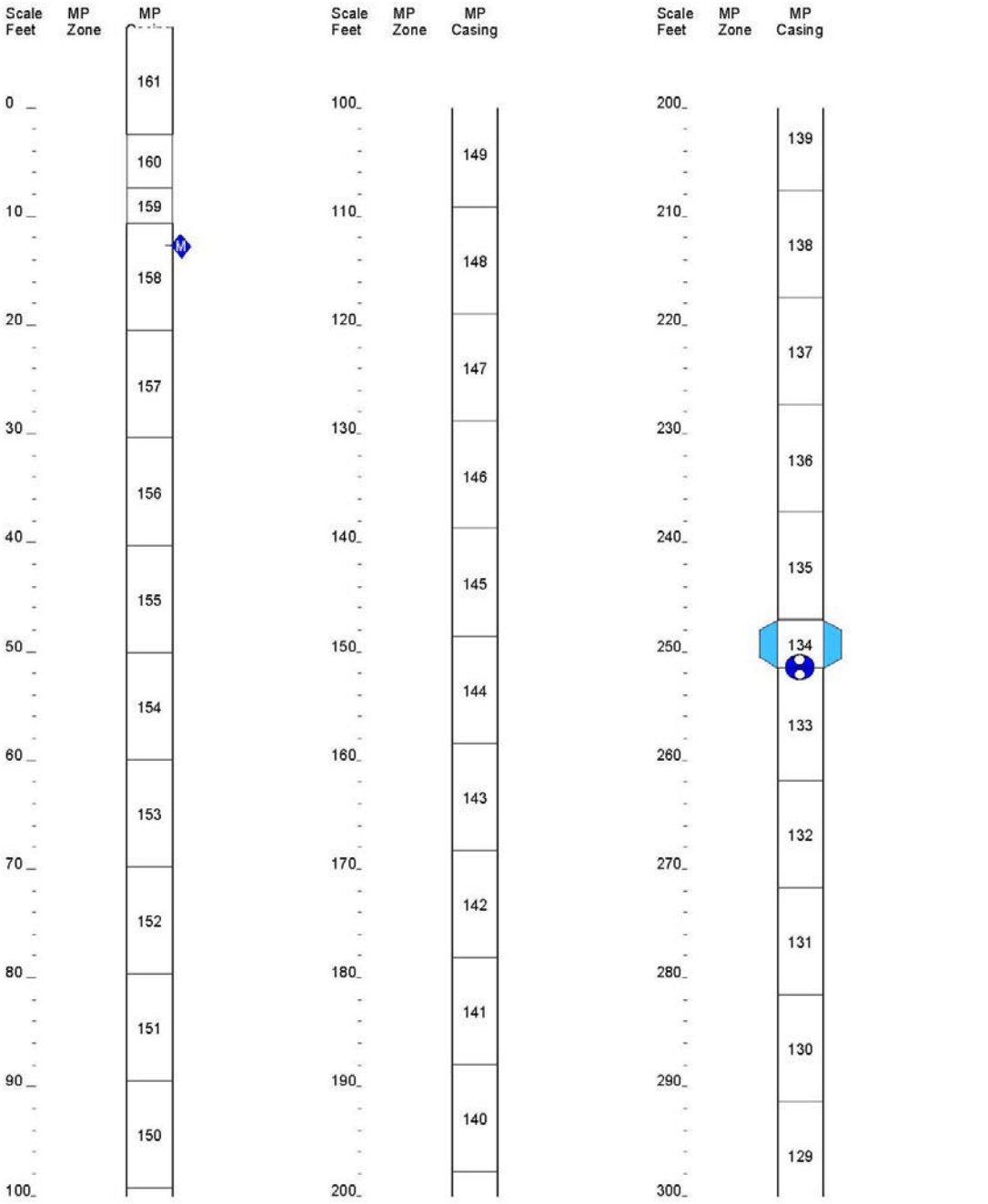
(5) 0607 - MP55 Hydraulic Pumping Port

(6) 0608 - MP55 Magnetic Location Collar

Wed Nov 02 10:22:11 2005

Summary Casing Log
CWI-INL

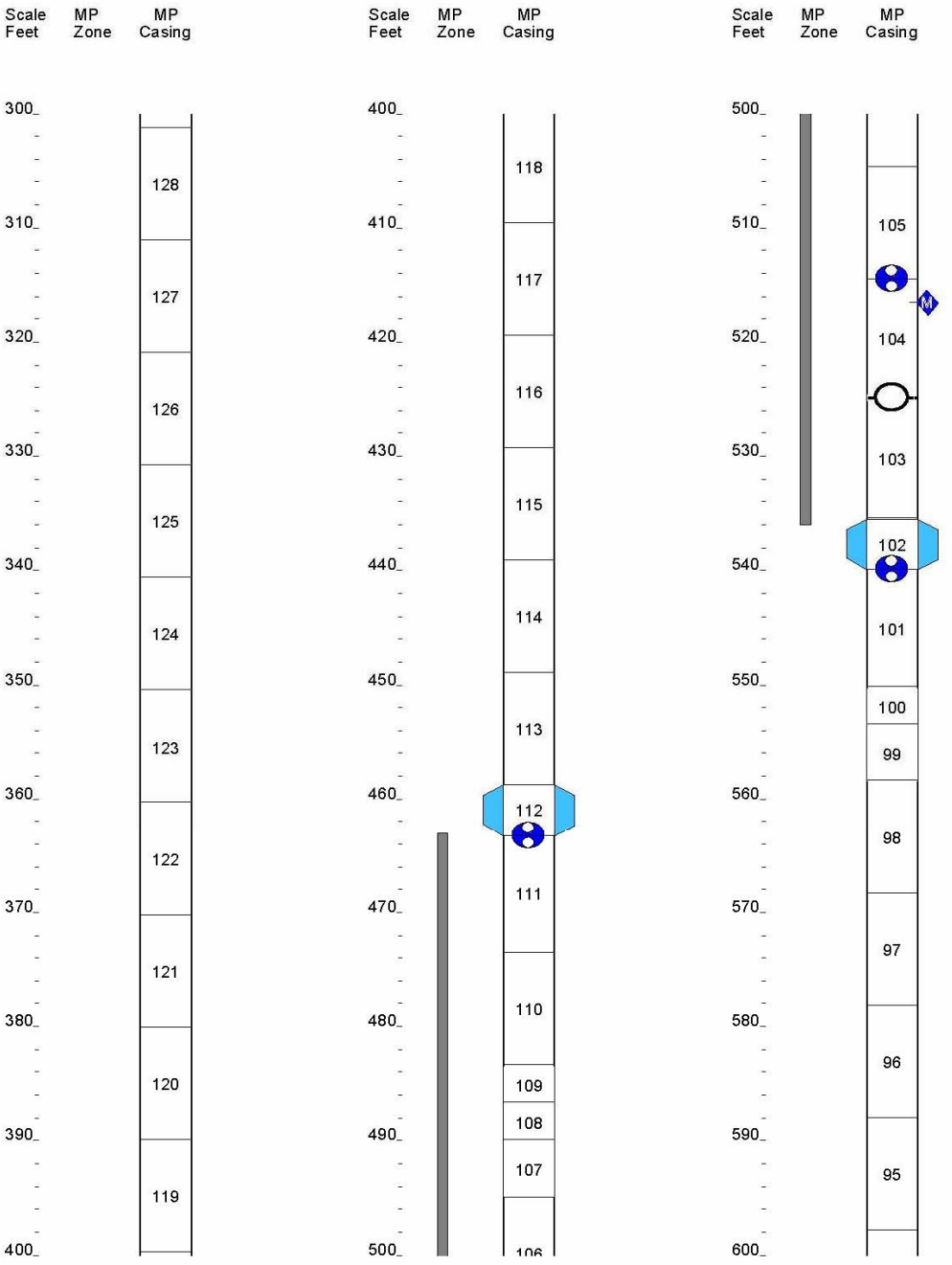
Job No: WB 843
Well: Middle-2050A



Wed Nov 02 10:21:16 2005

Summary Casing Log
CWI-INL

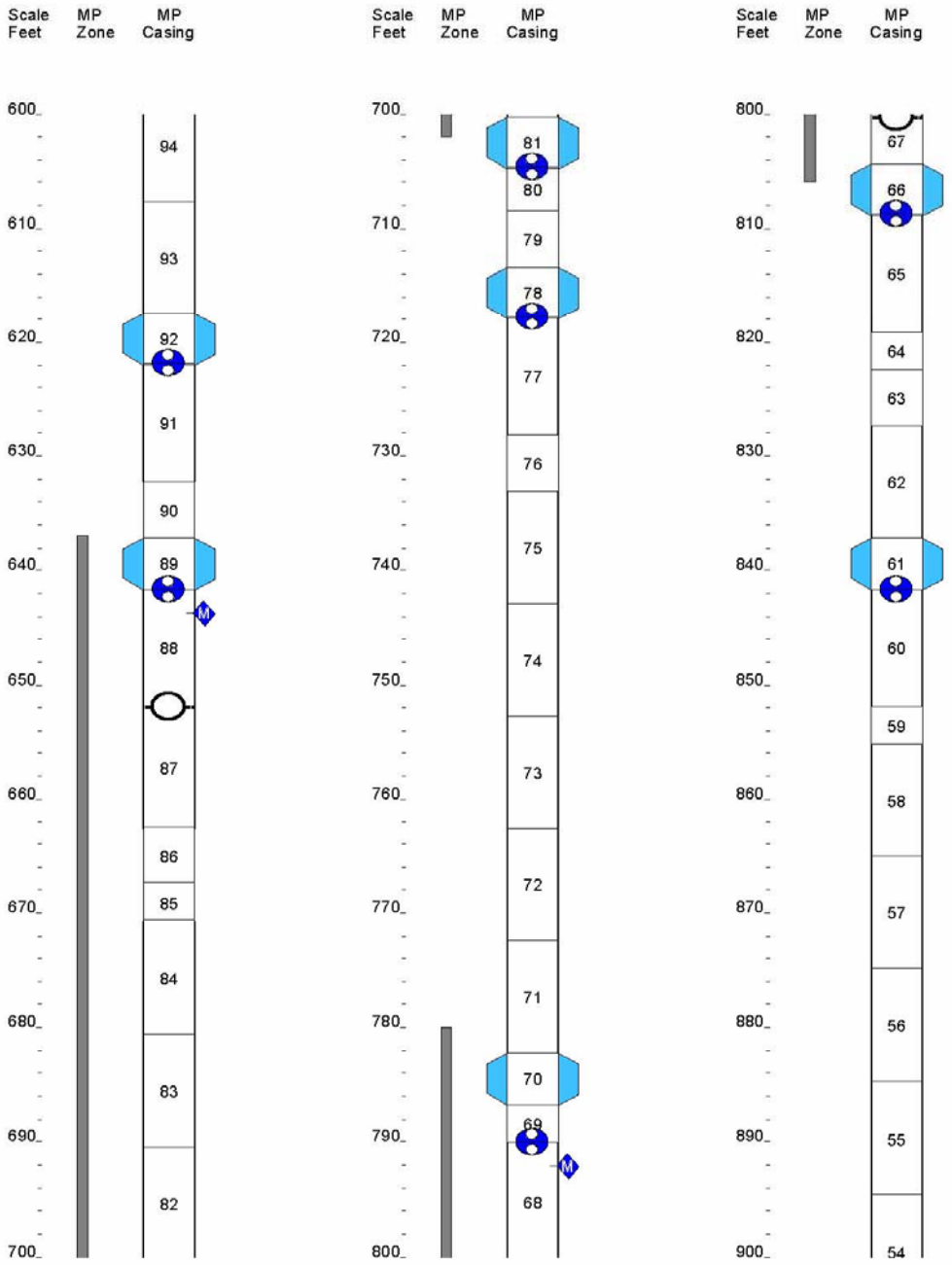
Job No: WB 843
Well: Middle-2050A



Wed Nov 02 10:21:17 2005

Summary Casing Log
CWI-INL

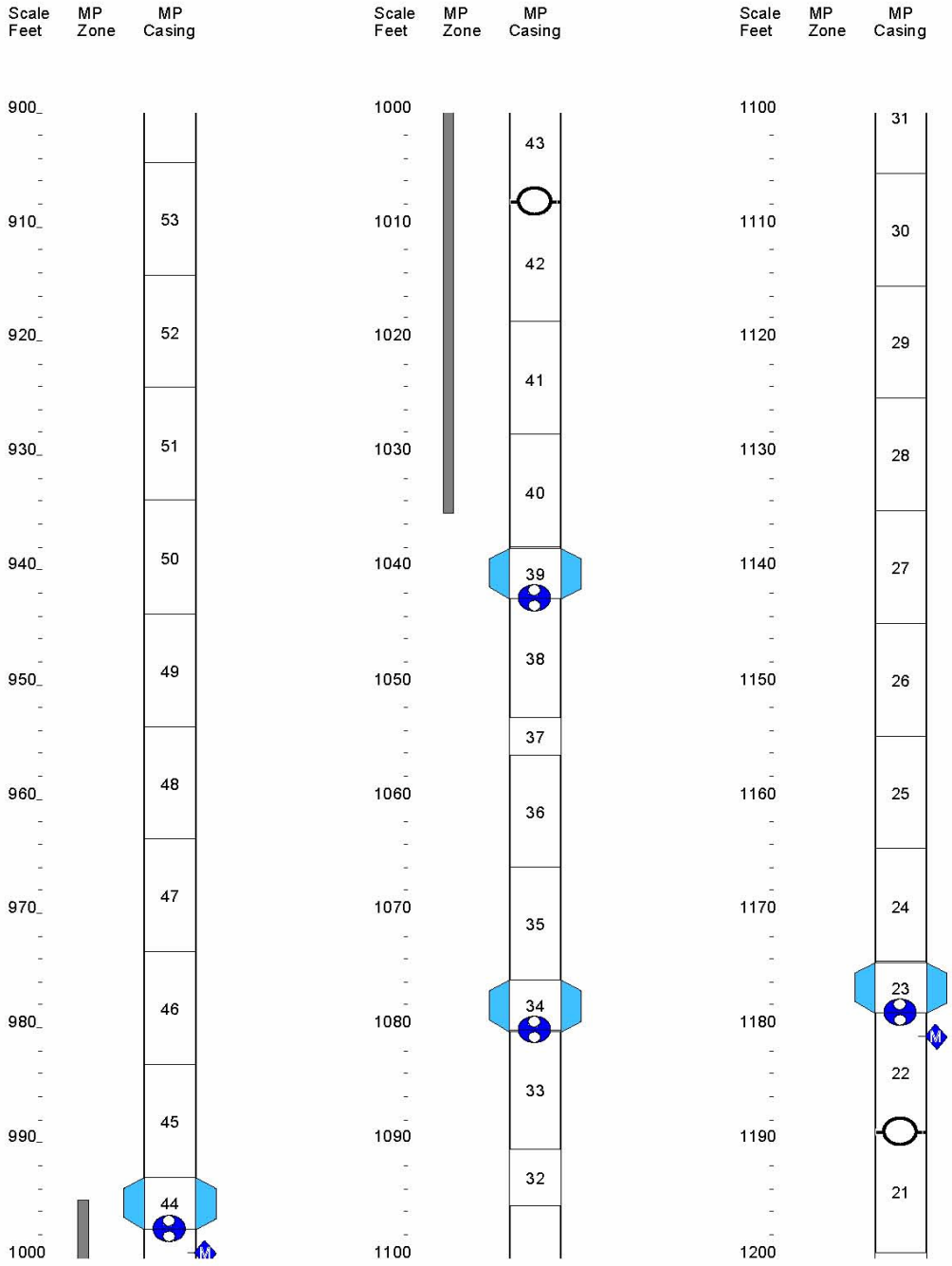
Job No: WB 843
Well: Middle-2050A



(c) Westbay Instruments Inc. 2000 Wed Nov 02 10:21:17 2005 Page: 3

Summary Casing Log
CWI-INL

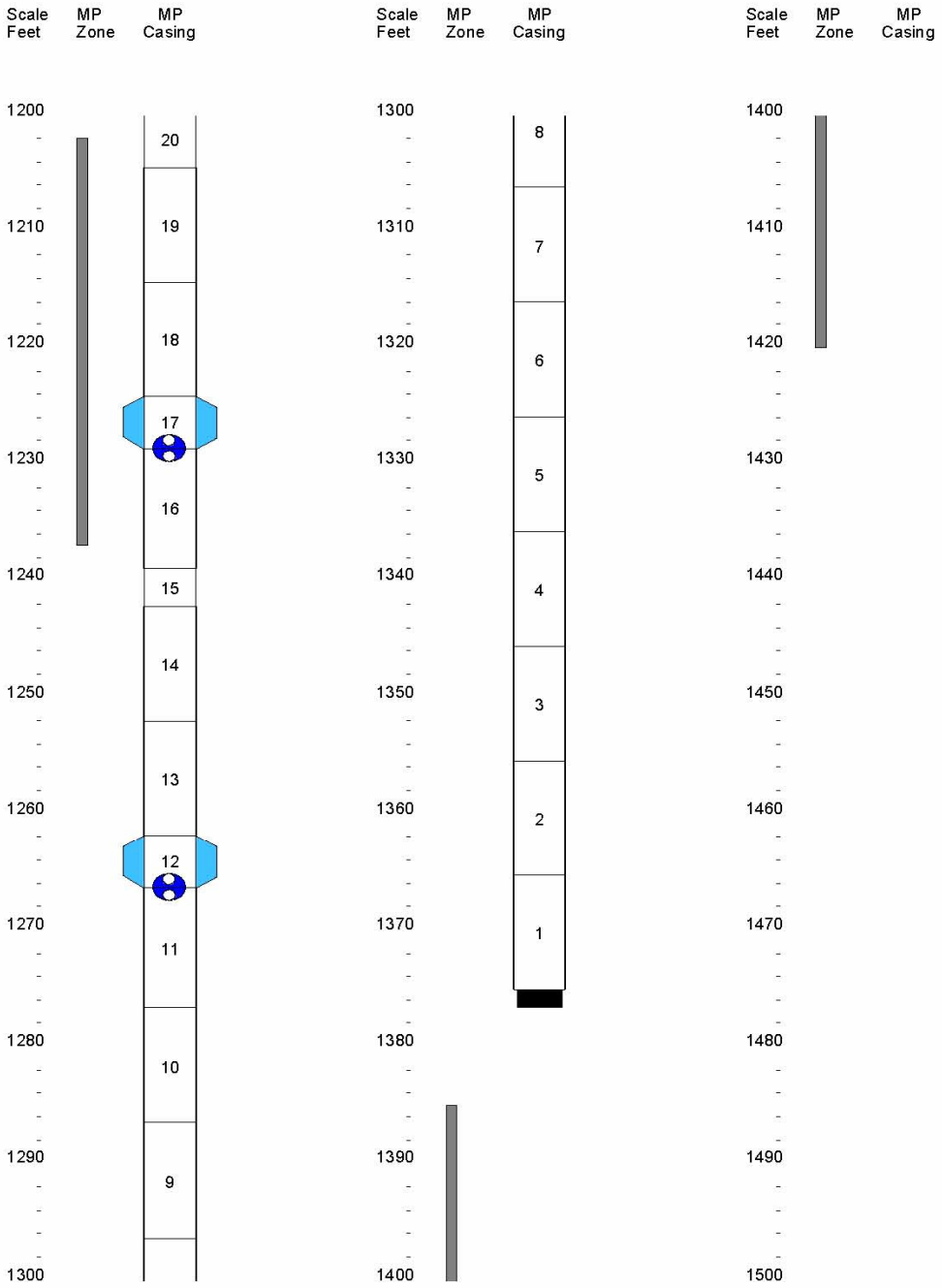
Job No: WB 843
Well: Middle-2050A



Wed Nov 02 10:21:18 2005

Summary Casing Log
CWI-INL

Job No: WB 843
Well: Middle-2050A



Wed Nov 02 10:21:37 2005

Summary Casing Log

Company: CWI-INL
Well: Middle-2051
Site: Idaho National Lab
Project: Groundwater Investigation

Job No: WB 843
Author: DL

Well Information

Reference Datum: Ground Level
Elevation of Datum: 0.00 ft.
MP Casing Top: 0.00 ft.
MP Casing Length: 1178.26 ft.

Borehole Depth: 1200.00 ft.
Borehole Inclination: Vertical
Borehole Diameter: 0.00 in.

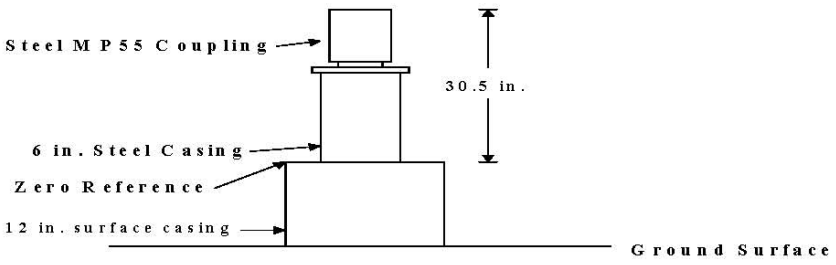
Well Description:
INL
Other References:
Rev 1 Aug 17, 2005, Rev 2 Aug 18
Packer zones added Aug 18
Rev 3 Aug 30, Port lowered

File Information

File Name: 2051_R3B.WWD
Report Date: Wed Nov 02 10:24:34 2005

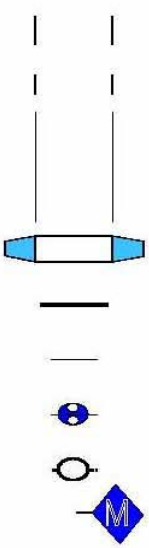
File Date: Sep 03 15:17:12 2005

Sketch of Wellhead Completion



Legend

(Qty) MP Components (Library - WD Library 7/27/00)



(10) 060115 - MP55 Casing 2 (1.5M/5F)

(4) 060110 - MP55 Casing 3 (1M/3F)

(107) 060130 - MP55 Casing 1 (3M/10F)

(13) 0604 - MP55 Packer 100mm PVC(1.5M/5F)

(1) 0603 - MP55 End Plug

(116) 0602 - MP55 Regular Coupling

(14) 0605 - MP55 Measurement Port

(5) 0607 - MP55 Hydraulic Pumping Port

(6) 0608 - MP55 Magnetic Location Collar

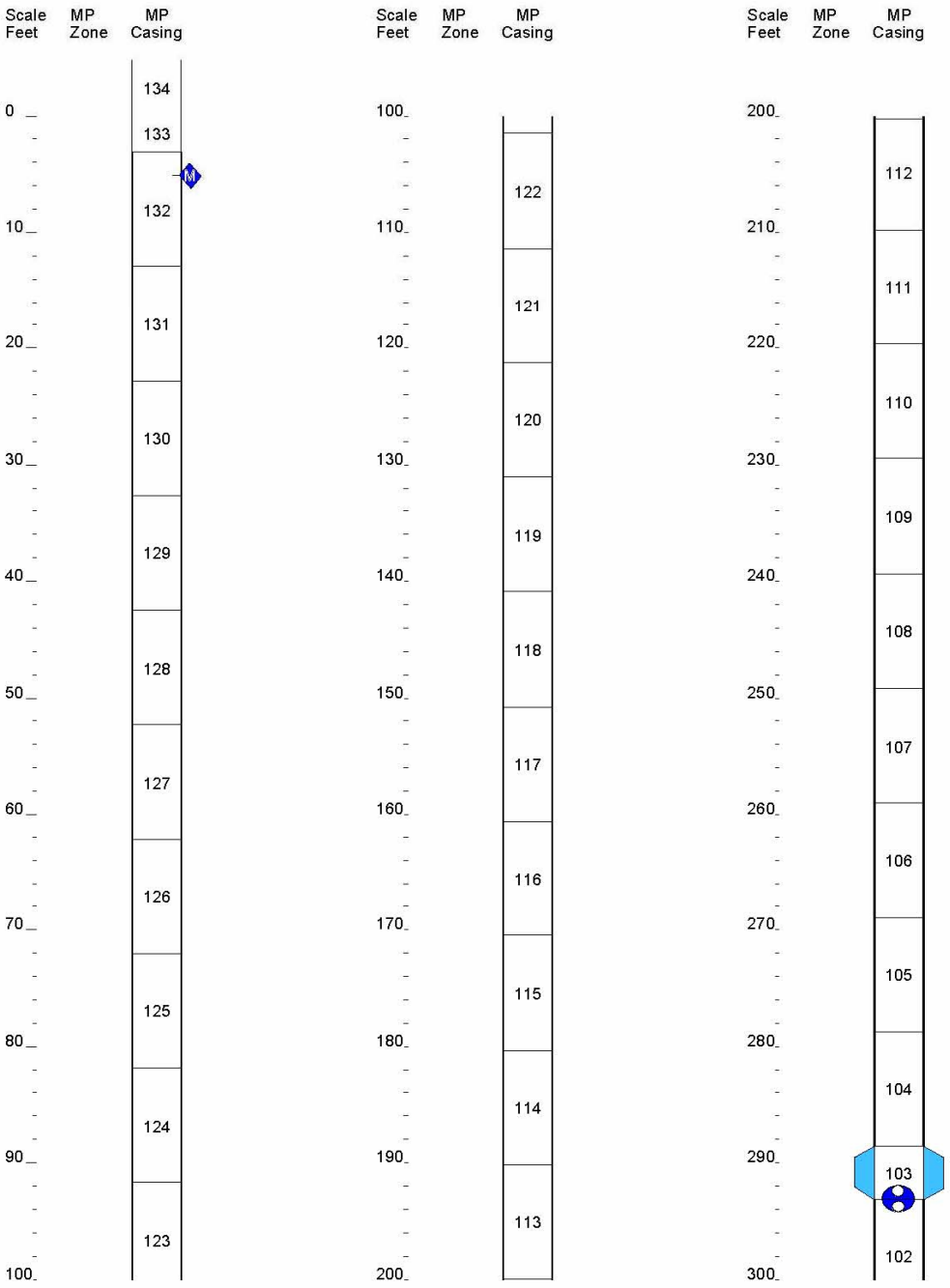
Geology

Rock

Backfill/Casing

Summary Casing Log
CWI-INL

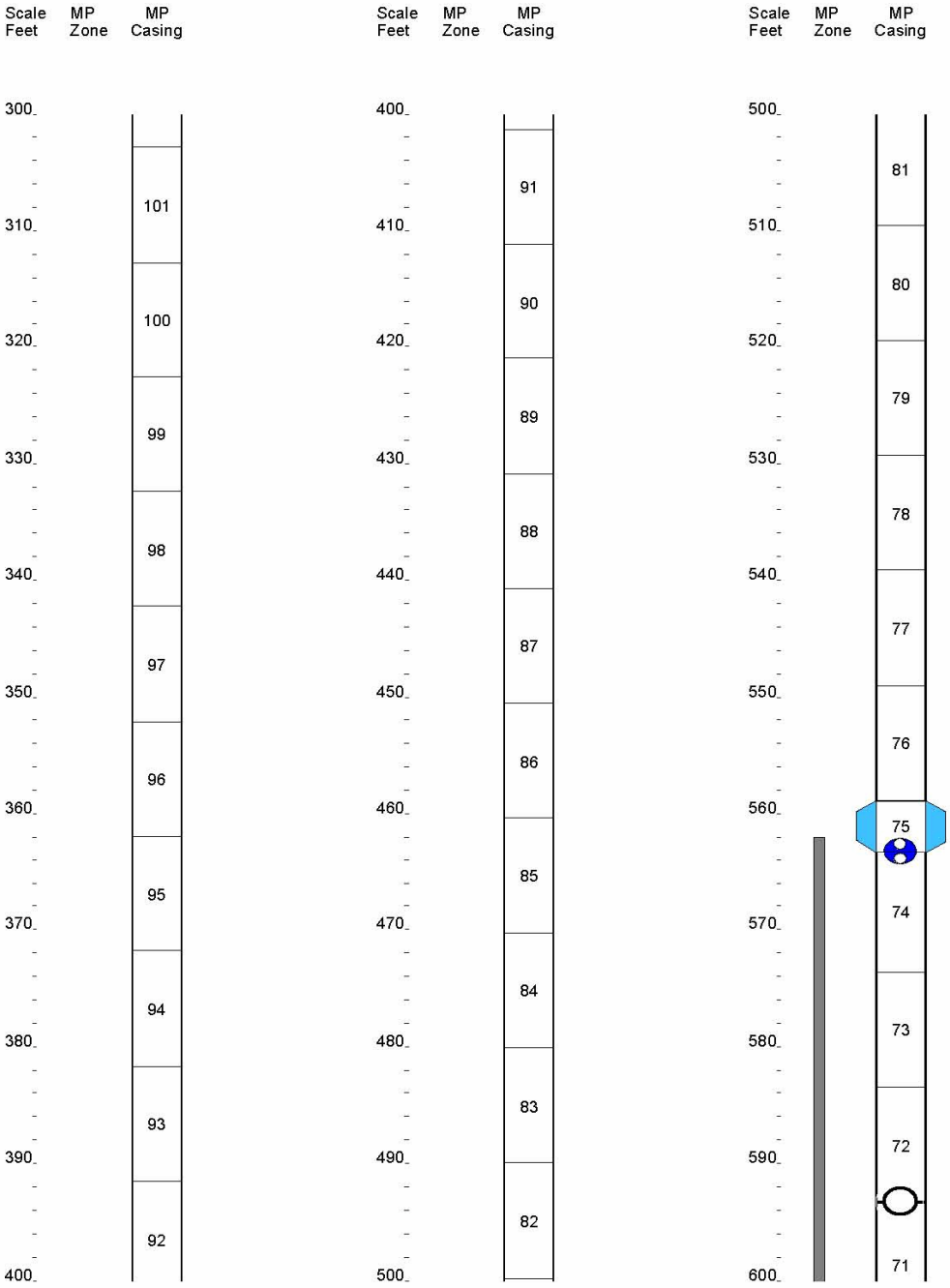
Job No: WB 843
Well: Middle-2051



Wed Nov 02 10:26:02 2005

Summary Casing Log
CWI-INL

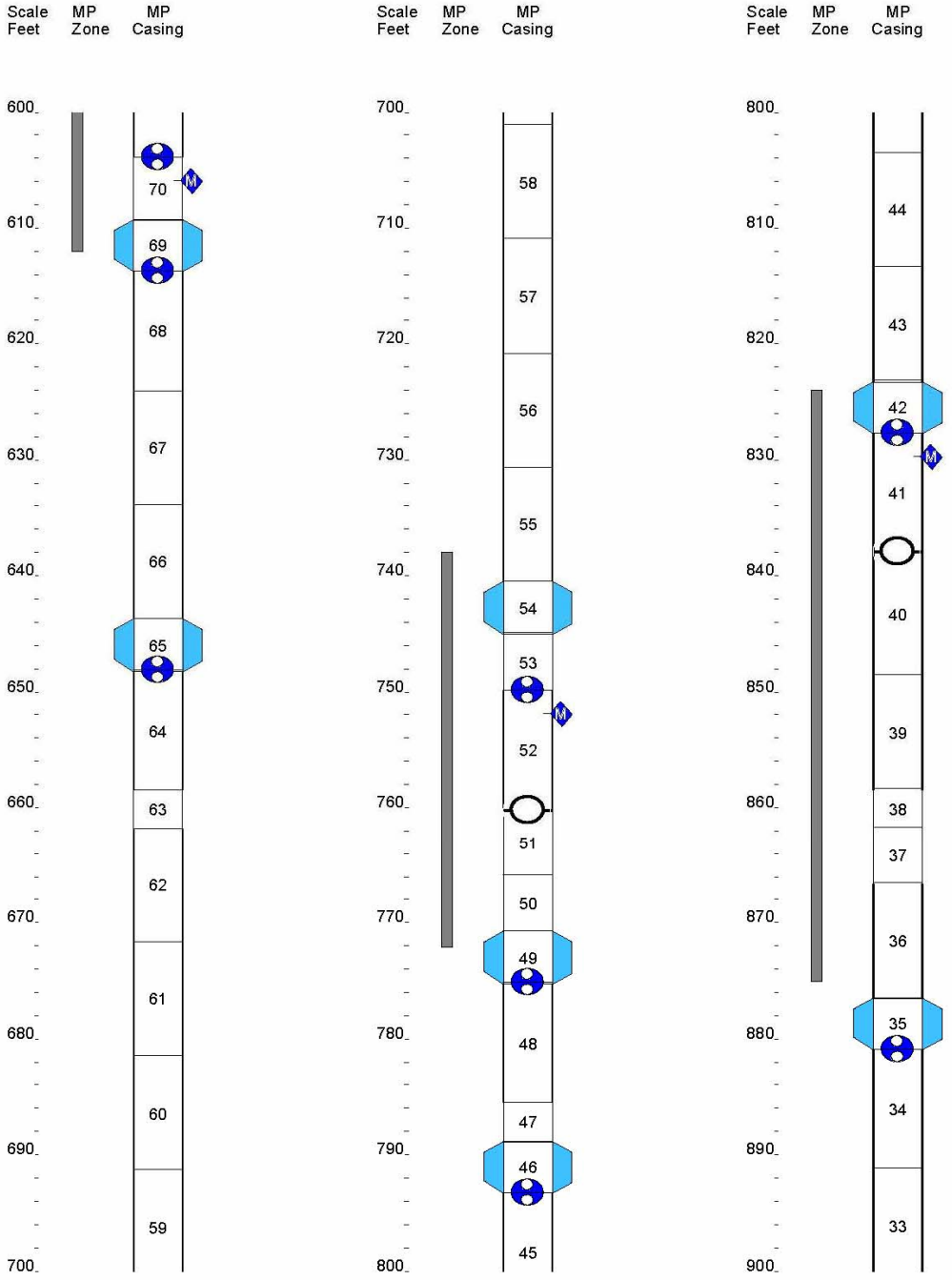
Job No: WB 843
Well: Middle-2051



(c) Westbay Instruments Inc. 2000 Wed Nov 02 10:26:02 2005 Page: 2

Summary Casing Log
CWI-INL

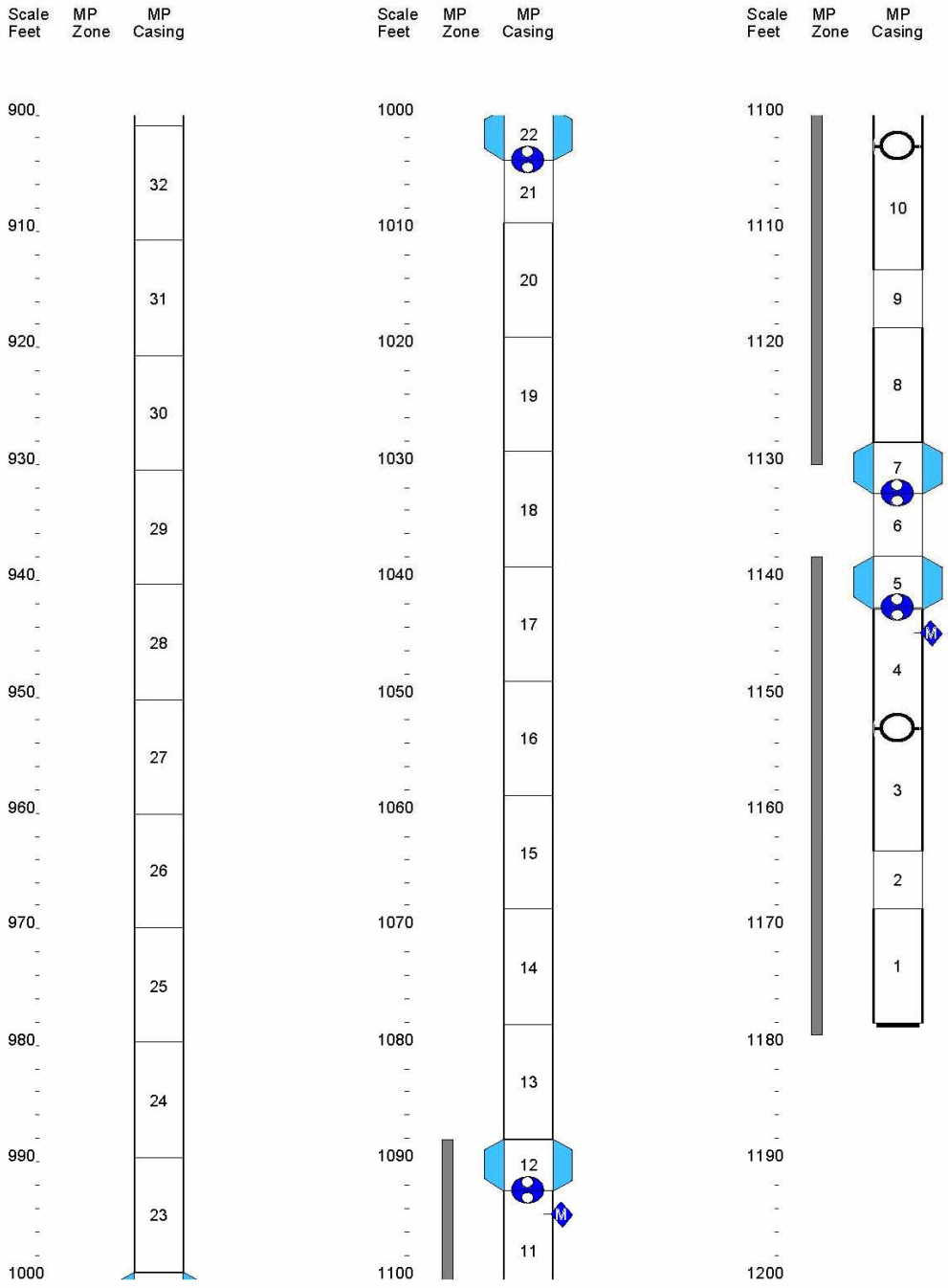
Job No: WB 843
Well: Middle-2051



Wed Nov 02 10:26:02 2005

Summary Casing Log
CWI-INL

Job No: WB 843
Well: Middle-2051



Wed Nov 02 10:26:03 2005